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THE MUSHROOM GROWERS'
ASSOCIATION

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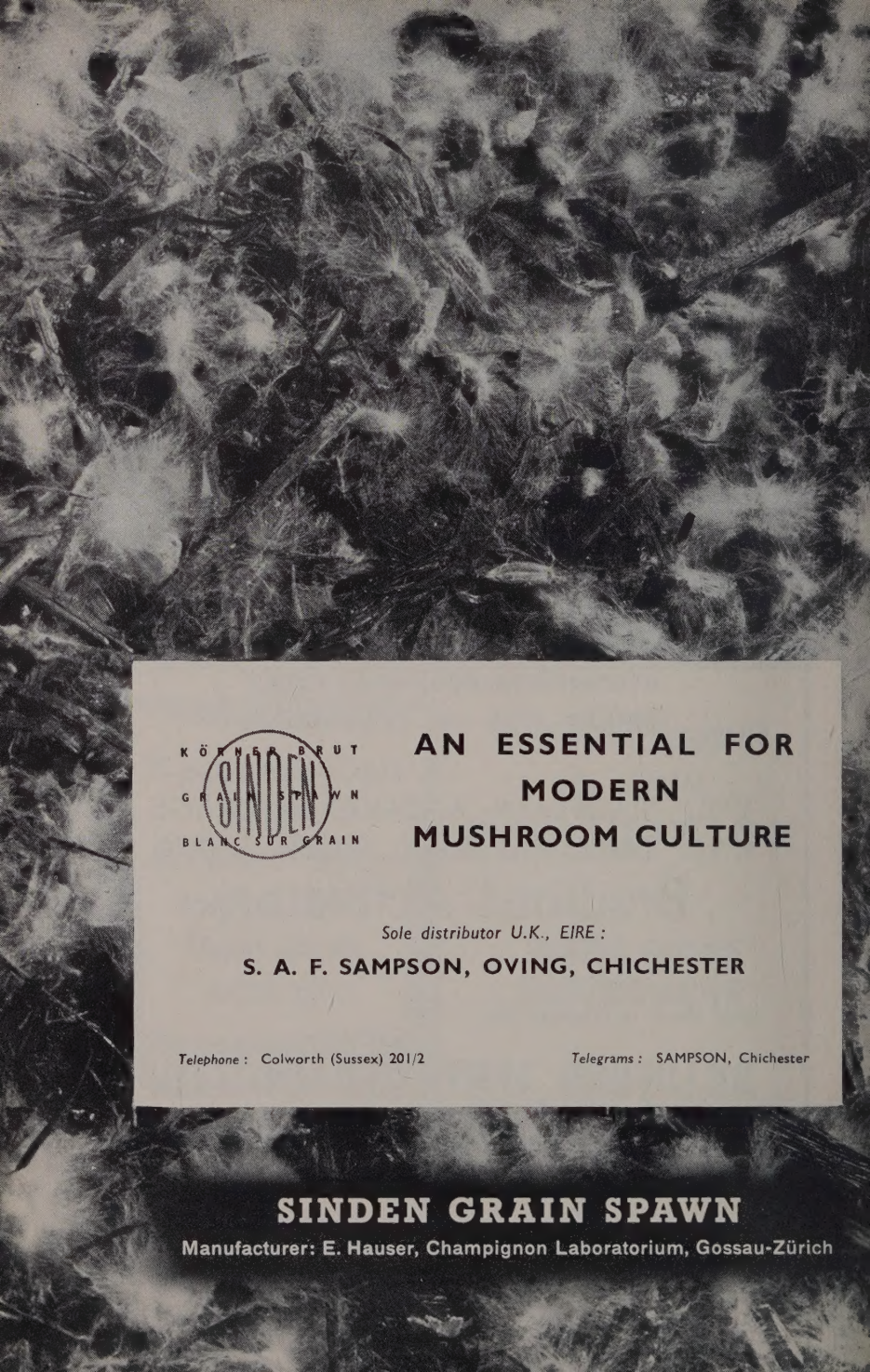

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The
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JUNE, 1956
NUMBER 78

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EDITORIAL

OUR FRIENDS

Month in and month out, ploughing through a mass of details in connection with publicity schemes, membership drives, farm walks, the International Conference (every three years), the Mushroom Industry Exhibition and the daily tasks of those concerned with the running and well-being of the Mushroom Growers' Association, this Bulletin regularly appears. It is true that, sometimes, our monthly appearance is a bit late, although by no means as late as some publications which we can mention, small though that comfort may be.

This monthly journal, which we ourselves more often than not describe as a small, modest publication, continues to provide a medium through and by which growers in many lands can express their views on this and that aspect of modern mushroom cultivation. We provide too, an important link between growers in this country and abroad.

We are glad to tell you that, financially, we still stand on our own feet and again we point out that this is due in great measure to the support we receive from our advertisers. True it is that we, as a publication, do offer high class specialised advertising at a reasonable rate. And whilst on the question of advertising rates we say, with some pride, that in spite of the many advances in the cost of labour and materials over the past few years, advances at a rate unparalleled in the history of this country, we, so far, have managed without making any increase in our charges. It cannot, of course, continue so indefinitely.

The toast, then, is to "Our Friends," particularly those in the trade who give us their loyal and regular support. Without them we would no doubt continue, but somewhat more lightly clothed. With their continued support we aspire to much greater things in the future.

Support them then who support us—SHOP WITH OUR ADVERTISERS.

WRA.

GOING TO PARIS ?

If you are going to the International Conference in Paris this month and can spare the time to travel South, the Syndicat Agricole des Cultivateurs de Champignons du Vaucluse at " Les Sources," Portail Magnenen, Avignon (Vaucluse) will be very happy to see you and to show you round their mushroom establishments.

In a letter, Monsieur Pierre Lombrage, Secretary, says:—"We should like you to know that we are at the disposition of your members " and adds, " Naturally, it would be a great pleasure for us to show you round our establishments."

Any members who wish to take advantage of this very kind offer should communicate direct to:—Monsieur Pierre Lombrage, Biote Postale 70, Aix-en-Provence, (B. du Rhone).

YES, HE IS A MEMBER

Since the appearance in the B.B.C. television programme, "This is your life," many enquiries have been received at MGA Headquarters asking if Wing Commander Stanford-Tuck, a Kent mushroom grower, is a member of the MGA. He isn't but his wife, Mrs. Joyce Stanford-Tuck, is a Grower Member, which rather amounts to the same thing.

Among other things, Wing Commander Stanford-Tuck had a most distinguished career with the Royal Air Force in the Second World War and displayed gallantry of a very high order. We add our congratulations to the very many which he has already, no doubt, received.

CANADIAN MUSHROOM GROWERS' ASSOCIATION FORMED

We have received news of the formation of a Canadian Mushroom Growers' Association, with offices in Toronto, Ontario.

Lloyd H. Leaver, Secretary of the new organisation, in a letter states that " The object of the Association shall be to provide a medium through which the problems of the Mushroom Growers may be solved by joint study and consideration and that the over-all standards of production and co-operation in the industry may be enhanced."

Officers and Directors of the new Association are:—President, Mr. Jeff. Gahm; Vice-President, Mr. Robert Flood; Secretary, Mr. Lloyd Leaver and Treasurer, Mr. Robert Jones, with Mr. Robert A. McNair and Mr. Robert Reid Directors. These officers have been elected to serve in 1956 and one Director has still to be appointed. This vacancy has been offered to a large group of growers in Western Canada.

The formation of this Association represents an important step in the Canadian mushroom industry and we of the MGA wish it every success.

Fred. C. Atkins seeks co-operation in the . . . . . .

CECID CENSUS

World Authority interested in our problem

The last week in April, 1956, was Cecid Week. The NAAS entomologists were informed by the MGA that its grower members had been asked to submit samples of Cecid larvae to provincial headquarters so that we might learn which species were at work and the extent of the epidemic. The results are now being collated.

In the meantime the MGA Research Committee wished me to contact **Dr. H. F. Barnes** at Rothamsted, world authority on Cecids, and it was encouraging to find him so interested in our problem. He at once pointed out to me that there were several different kinds of Cecid that damaged mushrooms, and it might be very important to be able to identify the various kinds before taking effective steps to attempt to control them.

I had already sought to obtain the technical descriptions of species associated with mushrooms, but it was at once obvious that I could not spare the time required. The *Cecidomyidae* family is immense, with 152 genera and over 600 species. At least two species found on mushroom beds have not yet been described, and the descriptions of the other half-dozen are scattered among entomological journals in Britain, the United States, Holland and North Africa.

Dr. C. A. Thomas, of Pennsylvania State College, has listed the following:

Mycophila speyeri Barnes. Barnes stated that the larvae feed on mycelium. According to Anderson, Dr. Mathias Thomsen reared this species from larvae found in decaying mushrooms at Gentofta, Denmark. Orange larvae, paedogenetic.

Mycophila fungicola Felt. Reared from larvae from young mushrooms collected in California in 1897. White or yellowish larvae, paedogenetic.

Miastor sp. Taken from the gills of mushrooms and spawn in England. Pearly-white to pallid yellowish-white larvae, paedogenetic.

Cecidomyid larvae, unidentified. Unidentified Cecid larvae are occasionally found in immense numbers on the casing soil and on the mushrooms, where they mine the outside tissues, giving the mushroom a yellowish, slimy appearance. They also feed on the mycelium in the beds.

Lestodiplosis sp. According to Felt, these larvae are predacious on mites.

Apart from the *Mycophila speyeri* and *Miastor* sp. mentioned by Thomas, four other species have been recorded in England, according to Barnes:

Mycophila barnesi Edwards. Described on a male and females caught on windows at Letchworth. Larvae paedogenetic.

Pezomyia vanderwulpi (Meijere). Reported by Speyer to be present with *M. speyeri* on the mycelium of mushrooms at Cheshunt.

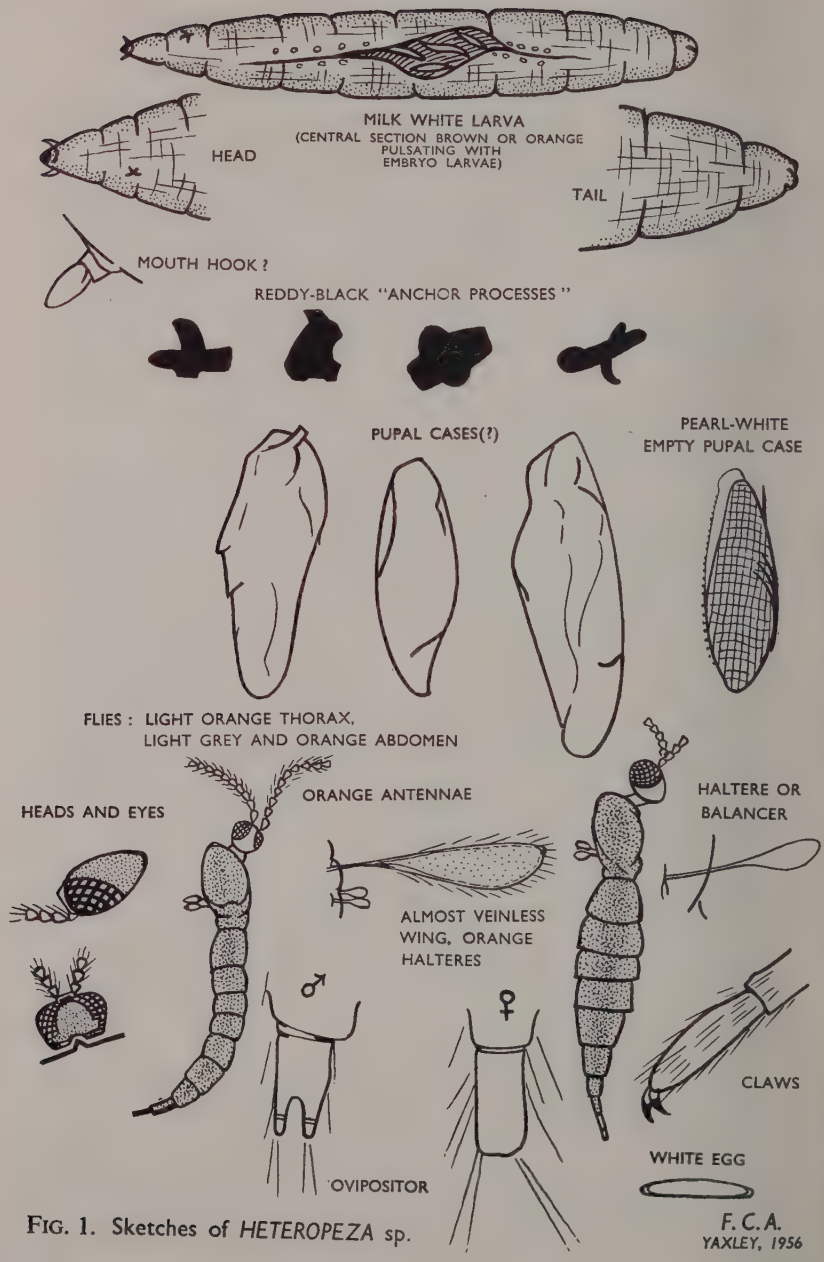

FIG. 1. Sketches of *HETEROPEZA* sp.

Lestremia cinerea Macquart. Reared by Speyer from mushrooms in Sussex.

Heteropeza sp. Undescribed. Reared by Moreton at Wye. White larvae, paedogenetic.

It was not a little disconcerting to realise that the Cecid fly sketched by Thomas and published in most textbooks on mushroom growing, including my own, has never been recorded in Britain, and that the only Cecid fly I have seen is the undescribed *Heteropeza* sp.

Obviously it would be helpful to be able to refer to illustrated descriptions of these eight or so species associated with mushrooms, and Barnes wrote: **" When we know better what kinds are involved a leaflet should be prepared so that non-specialists can separate them correctly."**

He adds: " I am hoping that specimens, especially adults (flies), from as many places as possible will be sent to me (in 70% alcohol) and that I will have time to deal with them and finally prepare such a leaflet."

I pointed out that growers do not normally carry supplies of 70% industrial alcohol. He has now armed me with suitably filled vials, and we hope over the course of the next few months to collect a representative sample of Cecid flies.

The flies are preserved for a long period if placed in alcohol alive and undamaged. This can be done by dipping a paintbrush in the alcohol, catching the flies on it, and transferring them to the bottle.

But first catch your fly! The real difficulty facing us is the rarity of the flies. Not many growers have ever seen them; fewer still have

FIG. 2. The Mushroom Midge (Cecid Fly). *Heteropeza* sp. x37. Drawn by B. D. Moreton (MGA Bull. 20, July, 1950).

FIG. 3. Compare with a *Mycophila* sp. drawn by Dr. C. A. Thomas (Pennsylvania State College School of Agriculture Bulletin 419, February, 1942).

recognised them. Many larvae produce more larvae, apparently indefinitely. I have succeeded in "breeding" two flies by placing clusters of larvae which have "balled up" on the sideboards into a corked test-tube; but I have had a great many failures.

Most of the Cecid flies I have seen in various parts of the country have suddenly appeared in their hundreds with no warning—but usually coinciding with a spell of warm sunshine.

If any *grower* has any Cecid FLIES, I hope he will send me samples, suitably secured within a test-tube or bottle bearing a label recording date and place found. If any NAAS *entomologist* or the advisory staffs of any firm of *spawn-makers* or *sundriesmen* come across Cecid flies, would they please send them, preserved in 70% alcohol, to Dr. H. F. Barnes, Rothamsted Experimental Station, Harpenden, Herts., marked "Mushroom Cecid Census"?

No one knows what conditions result in larvae ceasing to reproduce paedogenetically and to pupate instead. I myself have never seen flies without prior massing of larvae on the sideboards: but the presence of these massed larvae does not inevitably denote the onset of pupation and fly emergence. If pupation could be induced it would be a simple matter to kill the flies. For example, BHC has proved fatal even before the midges had taken their first flight.

Four further observations on the behaviour of *Heteropeza* sp. may be helpful in the study we hope someone will soon undertake at Littlehampton or elsewhere:

(*a*) Larvae feeding on the mycelium at the base of the mushrooms, and those climbing up the stems and into the gills have a brownish section just beyond halfway from the head, and within this area may often be seen the embryo "daughter" larvae.

(*b*) After a heavy watering of the beds, those larvae which migrate to the drier sideboards are white and translucent, and appear to me to be no longer paedogenetic, but ready to pupate.

(*c*) Both the "paedogenetic" and "migrating" larvae possess the distinctive "anchor process" just below the head.

(*d*) In 20 consecutive crops in the Spring of 1956, cased with soil and with peat alternately, larvae appeared on the surface of all the peat-cased beds and none was seen on any of the soil-cased beds. I failed to find any at the bases of mushrooms grown on these soil-cased beds, but in the past 10 years have on occasion witnessed odd invasions on soil-cased beds.

And a footnote for the harassed grower. Cecid larvae on the bed surface succumb in their thousands to **diazinon** dust applied between flushes. **At last there does appear to be a larva killer.**

Diazinon is an organic phosphorus compound produced by the Geigy Company and marketed in this country by W. Darlington & Sons Ltd., who have been invited by the Editorial Board to describe in a subsequent issue of this Bulletin their recommendations and the results of their research to date.

I wish to express in print my appreciation of the considerable assistance given me by Mrs. E. M. Mitcham, in collecting specimens and studying them under the microscope.

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NON ANGELI SED D'ANJOU

In some comments on the Paris Conference on Page 128 of April's Bulletin 76, I mentioned there would be a free wine-tasting on the estate of Monsieur Dialand, with lunch in the open air served by *angevines*. So far so good; but in my ignorance I translated angevines as " angels of the vine." I have been corrected. It is the name given to persons of the feminine sex born in Anjou, just as a " londonienne " is a girl or woman born in London. A pity! As one Continental correspondent put it: there will certainly be some pretty ones among them, *mais egalement d'autres*. F.C.A.

OTHER FUNGI? — YES!

says J. R. HUNTINGTON

I have only just had the opportunity of reading the January Bulletin 73 and in particular Fred. C. Atkins' polemic directed against Mr. M. D. Austin's suggestion that the growing of other edible fungi warrants investigation.

" We almost demanded retaliation; but it rarely came." No one ever rose to his bait, no one ever contradicted him . . . Damn it, he's absolutely praying for a fight! As an apprentice of a mere three months standing I possess the necessary admixture of ignorance and impudence to enter the lists against him.

Mr. Atkins has spoken for those two sacrosanct and mythical twentieth century figures, " The Economic Man " and " The Reasonable Man." Let me champion the claims of that timeless and admirable figure " the Gastronomic Man "; when he comes in at the door Economics and Reason fly out of the window—and quite right too! They make an ill-assorted trio.

I wonder how many MGA members have ever eaten Morels! I would like to envisage those few who have, spending sleepless nights and suffering acute niggling attacks of conscience, wondering why—but for Economics—they bother to grow what is by comparison a weak anæmic tasteless caricature of a poor relation—the much vaunted *Psalliota Hortensis!*

I have not myself eaten Morels for some thirteen years but the fragrant memory of that last dish is still as fresh and real in my mind as a mystical experience!

As for appealing to a commercially—negligible minority of mycophagists—whatever that may mean—Fiddlesticks! Once bring the Morel under cultivation and introduce it to the general public, now almost unaware of its very existence, and . . . Well, I mean, even the British who know nothing about fungi and less about cooking eventually recognise a good thing when it stares them in the face long enough and when that times comes—except as an odd curiosity, exit *Psalliota Hortensis!* All of which proves conclusively—blast Economics —that Mr. Atkins is right and I'm wrong if only as a matter of self-preservation!

Be that as it may, when I commence operations on my own I fully intend to have a small unreasonable uneconomic experimental house devoted to the attempted cultivation of Morels; and when I succeed and have cornered the market? Well, the toast at the party to be held by the Worshipful Company of the Commercially Negligible Minority of Mycophagists—myself in the chair and Mr. M. D. Austin as guest of honour—will be, " Other Fungi? Yes! Morels."

PUBLICITY NEWS — HOW THE COUNTIES STAND

With such a small minority of growers still remaining outside the great body of Grower Members who have signified their support of the 2d. per spawn carton scheme for publicity, progress in this field has now slowed up somewhat but the effort to persuade those outside to come in continues and comparatively very few, unconvinced either (*a*) of the need for publicity or (*b*) of the effectiveness of the effort so far, remain in the cold.

With the total in support now nearing 90%, the percentage support given by the various counties, excluding Wales, Scotland and N. Ireland, makes interesting reading and shows that no less than 17 counties are 100 per cent. in support of this scheme. This includes Kent and Surrey where large numbers of the MGA members are congregated. Not far behind is Sussex which, as a county, contains the largest number of MGA members.

It is a little difficult to draw comparisons inasmuch as some counties provide maybe two or three members only and this operates severely when, as in the case Middlesex for instance, one Grower Member is in and one out, making the percentage only 50. Bracketed at the foot with Middlesex are Lincolnshire and Wiltshire and the latter two, as in the case of Middx., each have only two members, one in and one out. Devon returns 60%, Hampshire 66%, Staffordshire 67% and Oxford 68%. Lancashire, with a strong MGA membership, sits on the disappointing figure of only 68%, Gloucestershire rises to 75% and Yorkshire, showing much improvement, now stands at 81%, with Essex 89% and Sussex 90%. Greatest improvement since the first list of supporters was published has undoubtedly been shown by the Sussex members.

In Scotland the supporters account for no less than 86% followed by Eire (70%), Wales (67%) and N. Ireland (63%).

The overall result is astonishingly high but, quite unabashed, the Publicity Finance Sub-Committee is continuing its efforts to raise the total even higher.

Mr. G. W. Baker, Chairman of the MGA, says "We shall not be satisfied until we get 100%."

On the Publicity front in general, main news concerns the steady support given to the scheme by Salesmen and Sundriesmen in general and the attention of all members is called to the list of those in the trade who have made contributions.

At the Chelsea Flower Show MGA recipe leaflets were distributed from the stand of Shirley Organics Ltd., by courtesy of the Managing Director, Mr. V. L. Barrow.

The mushroom party at the Women's Press Club, Carey Street, London, on 30th May, went off very well. A large number of women journalists were present and Mrs. Lawrence, wife of Capt. G. P. Lawrence, former MGA Chairman, gave a short speech. Members of the MGA Executive Committee were present and answered many questions. A full report of this important gathering will appear in the next issue of the MGA Bulletin.

WHAT DO WE WANT FROM RESEARCH?

By R. L. EDWARDS

My friends would probably agree that I have always had a misguided sense of humour, and it is rather fun being on the opposite side of this question. Before getting down to what *I* think *we* want, I should like to refer to an old topic recently revived, the original MRA programme. I was not responsible for deciding that the first main object should be a synthetic compost, a decision which has been blamed for subsequent lack of interest, so in supporting that decision I am defending the original Directors rather than myself. It should be remembered that at that time (1945) only heavy manure from transport stables was considered suitable for mushroom growing; the supply of such manure was diminishing and is by now totally inadequate for the needs of the industry. Research on methods of using lighter manure was considered as an alternative to the synthetic compost programme, but it was decided that it would be much better to be completely independent of manure, and this was achieved. During the past ten years supplies of lighter horse manure have greatly increased and techniques for wetting and boosting it have been developed so that it has now substantially replaced the earlier sources of manure. As a result synthetic compost is shunned by most growers, I think mainly because it is no cheaper than manure, but there is still the possibility of a considerable reduction in cost, which would make it more attractive.

There is still much to be learned about composting, and one hears demands for research on compost, particularly short composting. Bearing in mind that the total amount of research which can be undertaken is strictly limited by the available money and staff, I do not think that composting stands very high in the list. Any grower can follow one of several methods of composting which have already been adequately described, and by applying reasonable judgment and skill—which will always be needed—can make a satisfactory compost. In my opinion it is unreasonable to ask research workers to spend their time studying variations on these methods, which may be confused by variations in the manure, when there are other problems which urgently need their attention.

When a Sub-committee of the Agricultural Research Council came to Yaxley to discuss the research programme in 1949, they were very interested in the problem of casing soil, and recommended that we should consider very carefully what could be done about it. The following year we started work on the physical properties of casing soils and artificial mixtures, work which continued until the Yaxley Research Station closed in 1954. I know that growers could not care less about the physical properties of soils, but the work produced a lot of useful information about casings, watering, and other things; it also led many growers to use peat as their main casing material.

Despite the growers' lack of interest in our approach to the problem, I am unrepentant in my belief that this aspect, the relation between the

casing, its management, and the formation and growth of mushrooms, is vitally important to us as growers. It will not be easy to solve because there are many complications, and it is a long term project. But, and I attach great importance to this, I think that if and when a solution is found, it will be of a kind which can be applied in commercial practice. The relevant factors, temperature, moisture content, ventilation, etc., are all inherently measurable and controllable, or soon will be. In contrast, horse manure is inherently variable and uncontrollable with anything like the same degree of precision. It is not practicable to measure its quality under conditions of commercial growing, and so any standardisation of composting method and supplements will still depend on the grower's assessment of his raw material for its application in practice.

Although I regard this casing-fruiting problem as so important, I would not give it first place in a programme of mushroom research to-day. In commercial terms I do no think there are many crop failures due to lack of knowledge in this field. Rather I would expect it to bring more crops up from average to maximum yields—but that is only a guess.

It is more urgent to deal with the possible causes of failures, the pests and diseases which afflict our crops more or less often and severely. Some of these are always liable to occur unless precautions are taken to control them, but can be prevented from doing continuous or serious damage by careful application of known control measures, e.g., Sciarid flies. Others seem to occur in waves, appearing on many farms within a short period, and causing an outcry for " something to be done about it." Examples are the recent " fearsome Phorid " fly, on a smaller scale Red Geotrichum a few years ago, Yellow Moulds, eelworms, and now Cecid larvae and the diseases associated with dying malformed mushrooms.

It is quite natural for any grower whose crops are seriously damaged to demand that something should be done to find a cure or preventative for his particular trouble, if one is not already known, and of course that is one of the main functions of our research stations. Whether all such demands can be met is another matter. I think all our research stations have more on their plates than they can digest, particularly ours which is in a state of transition, and so a choice has to be made, of one or more problems to be given priority. In making this choice there are two obvious criteria to be applied: first, urgency of need, second, and perhaps less obvious, availability of suitable staff and equipment. I would add to these a third, which I think very important, a careful assessment of the prospects of success, particularly of the tangibility of each problem.

Putting one or more of a limited research team to work on, say, a disease so nebulous that it might take several years trying to find a suitable line of attack before it is possible to start serious work on control of the disease, is of little immediate use to growers. We have a situation something like that to-day, with the phenomena variously described, officially or unofficially, as " The Thing," La France disease,

Mummy disease, Fusarium disease, " Dying Mushrooms," " Hard Gill," " Disorders of cultivated mushrooms," etc. In grouping these names together I do not for a moment question the reality of the three diseases Fusarium, Mummy and La France. They were all studied, described, and named by responsible biologists who knew what they were about. Our difficulty is that recognition of the diseases depends entirely on symptoms and cannot be clinched by isolating the causal organism. The mushroom can show only a limited range of symptoms, and we do not know exactly how specific these are. Two years ago, at the time of the first " La France scare " here, I visited several farms which were suffering serious losses. On some there was nothing definite on which to base an opinion. On others I was quite convinced that a disease of some kind was responsible for the losses, but even on any one farm the symptoms varied and did not fit the description of any of these three diseases, or of any other known disease. There must be many similar cases, and growers who suffer in this way naturally but sometimes inaccurately give one of these names to their particular complaint, which in fact may be a known or an unknown disease, or quite possibly a failure or abnormality due to cultural faults.

From the research aspect the point is that anyone setting out to study this problem would have to sort out this unholy muddle and find out how many different diseases there are now causing such disorders, and decide by a farm to farm study, which of them is most widespread and/or causes most damage, before starting on the real object of finding a cure or preventative. I believe Miss Gandy has been trying to get a line on some of these outbreaks, but much as I respect her work I think it would be wildly optimistic to expect early results.

If we turn to the pests of mushrooms there are three which are at present causing despondency and alarm, not to mention actual losses. I refer to the resistant Phorid fly, Cecid larvae, and eelworms. Here we have three known pests which can be seen, bred, and introduced into experimental beds, and a great variety of insecticides and other possible means of destroying them. They come out well on the first and third tests of suitability for research, mentioned earlier, but not so well on the second, because at present there is no entomologist engaged on mushroom research at Littlehampton.

Nevertheless, in my opinion, research on all or any of these pests forms our best chance of getting useful results soon, and I hope the MGA Research Committee will put them high on its list of wants.

LARGE MGA PARTY FOR PARIS

More than 40 members of the MGA are attending the International Conference in Paris this month. Some members are going by air but the bulk of the party will travel by rail and sea, leaving London at about 9 a.m. on Wednesday, 13th June, and arriving in Paris at 6 p.m. The party is due to return on Sunday, 24th June. At least two MGA members are attending the short mushroom course at Pennsylvania State University in July.

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PINHEADS

99. I cannot let M. Poul Nøgaard's letter of last month pass without comment. My punning " Mr. No-Good " was quickly shown to be a mistake (M. Nørgaard himself laughingly correcting it by repeating several times " Vair-Gut, Vair-Gut, Vair-Gut "), when I discovered that even on my own ground I was not permitted to pay for drinks. More than that, I must add that my " Sun-ray " was also hot-topped—or hot-headed, as I prefer to call it—but even at that the " sour citrus " was always on my tail. True I found the choke had been out at 90 and over, but I seem to remember " No-Good " saying something about his hand brake being left on. I suppose there's a moral somewhere in that. We're all trying to go so fast (in mushroom growing) that we tend to forget the little important things.

100. Talking of hot heads, my worst enemy (who shall be nameless, but lives in the Peterborough area and is known as a pen-happy pseudo-scientific textician) spewed out one of his banal cracks when I told him I'd put a hot head on my " Sun-ray " car: " Like man, like motor!" said he. " It's no more than one would expect of you. You rush madly into everything, relying on hunches instead of reason. You're impatient of slow but sure results; you scorn science and the scientific approach; you listen to my advice and do the opposite; you pay out fat cheques to try out thin, weak illogical ideas; your textbooks are untouched by hand and unseen by eye; you deny the value of any study and put all your trust in your own hot-headed impulses and intuitions. You oughtn't to grow a mushroom at all." He's right, of course. We make more mistakes on this farm than are made by the combined efforts of the whole industry. But what does your office-imprisoned, crop-calculating, crop-ruining " technician " know of the thrill of a hunch that works out? I'll remain hot-headed: there's much more fun that way.

101. Hot-headedness plus hot (high pressure) steam led us recently into a Lambert high/low temperature 2-phase peak heat. The result, so far, is that I am probably the only grower in the country who knows anything about a secondary production of ammonia, how to produce it and how to hold it! The only thing I *don't* know is how to get rid of it! Ten days of low temperature second phasing didn't do it. Without much hope we spawned it; the spawn died. And yet I believe we shall get a crop. Why? How? A hunch again, but this time not mine I'm sorry to say. It came from old " Pen-happy " himself, in one if his more uninhibited (bar-side?) moments. As a good, sound, reasoning, non-hunch member of modern automation mushroom production you won't be interested in impulses so we'll leave the questions unanswered.

102. An unusual thing: I've just had a " sold out " notice from a spawn maker. Presumably temporary shortage owing to increased demand. Pinhead 86 was apparently right. Spawn makers *are* sitting on a gold mine. I hope they don't work it to death.

103. There are some indications that we are finding an answer to a long-standing question: Why do our mushrooms on peat casing

become less resistant to watering on and after the third flush? For two flushes they can stand all the water we like to apply without marking: after that they seem to turn visibly brown even at the sight of a hose pipe. There is also a disturbing tendency to pit and other undesirable markings. In Pinhead 92 I told how we tried steam sterilizing peat as a measure against a new brown-capped trouble. It didn't do the trick, but once again the unexpected has happened. Four houses had steamed peat on one side and unsteamed on the other. In every case mushrooms on the steamed side have remained clean after the other started marking, apart from a small area of the " brown " trouble. But, unexpectedly also, there is no weight improvement on the steamed side. It seems to us there must be some adverse conditions building up in non-steamed peat which curiously affect quality but don't reduce yield.

104. As shelf growers we are, of course, heading for the workhouse. But the way is hard and long and the square footage treads slowly, so with my usual impatience I've decided to speed up the rate of progress by turning over one third of our composts to synthetic. Patriotically we started with our own research-recommended MRA formula but, without results to prove it, I fear we may still be held back by some production. We are therefore trying Adco M against MRA in the same house. Now that's a smack in the eye for Adco M (Mr. Adco hasn't forwarded my £250 cheque yet—Pinhead 93! ! !) and they've asked for it. According to their advert in the Bulletin their synthetic only does 1½ lb. in 10 weeks at Haddenham, though Mr. Hawkins himself told us he'd done 3 lb. with it. Either it does 1½ or it can do 3. If the latter why depress us by talking of 1½? Or is Mr. Hawkins keeping something up his sleeve that produces the other 1½? I wouldn't blame him if he were, but I think we ought to know. (" If," not " what," Mr. Hawkins please). Well, Mr. Adco, are you going to let me get 3 lb. per sq. ft., or give me £250 to keep quiet about my results?

105. How right Sinden was when he told us in 1947 at Leeds that the tray or 2-zone system could not be recommended for the average grower in this country. I have recently seen an example of 2-zone as it should be done. On practically every tray farm I've seen hitherto the accent has been on inefficiency, muddle, turmoil, and singularly unsuccessful attempts to put a quart into a pint pot. But on the large farm I've just seen the accent was on 100% efficiency and the highest possible degree of cleanliness. It was indeed a joy to see the smooth, automatically-adjusted control and the simplicity of production where organisation was at its best. Here was none of the makeshift squalor of the average untidy tray farm. Haste was calculated, organised and routined. How attractive a tray factory can be when cleanliness and tidiness are an essential part of the process and not sacrificed on a loose principle that " The tray's the thing: the quagmire doesn't matter." What I've seen confirms Sinden and supports my own findings: if we're small we're better on shelves. But I like what I've seen and if I could do it I would now settle for trays. Note this, however, that I wouldn't consider the system unless it could be done properly and this would mean a minimum of 100,000 sq. ft. basic area and a capital of somewhere around £100,000. Anything less would be unintelligent.

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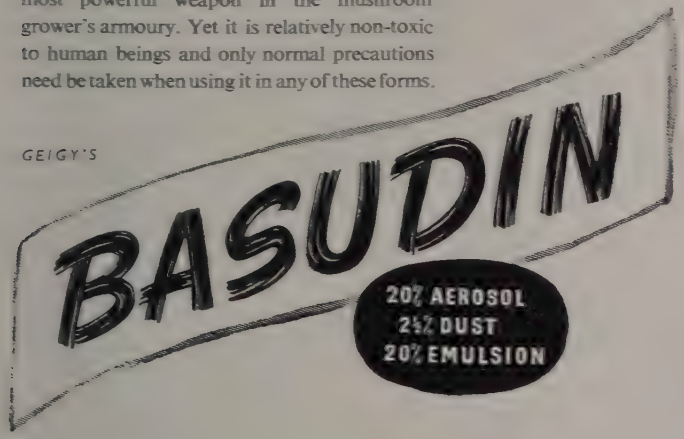

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MY WAY OF GROWING

By ARTHUR HAWKINS, Haddenham, Cambs.

Mushroom growing holds a fascination for most people, although in my case it took swine fever and disease in poultry to force a venture into what is locally held to be a very risky crop. So far as I know there are only two other mushroom growers in my county (Isle of Ely) and they are 30 miles away in the Wisbech district.

Previously I was a small fen farmer with 35 acres of black fen, a herd of pedigree pigs and a flock of poultry. I still farm the 35 acres but with a changed rotation to give the maximum amount of wheat straw for what is now my primary crop—mushrooms.

My first beds were made up experimentally on a small scale in 1951 with horse manure obtained locally and culture was given exactly as stated in the book.

The results were encouraging and a visit to Yaxley showed the possibilities of synthetic compost, so the following year beds made up with composted straw were tried. Straw is a very cheap commodity in the fens where it is often burned in the fields as a waste product. Cereals come into the fen farming rotation every two or three years and there is only a small number of livestock to utilize the straw.

Synthetic compost proved to be an economical proposition although I was getting only around $1\frac{1}{2}$ lb. per square foot, and the remaining pig sties and poultry houses were converted for mushrooms. The floors were concrete but windows had to be blacked out (with corrugated sheets) and the walls and roofs were insulated with asbestos sheets. Two sheds were heated with separate sectional boilers and a third shed left unheated. Together they represent 6,000 sq. ft. of cropping area.

At present with a rotation of winter wheat, spring wheat and potatoes I have sufficient straw for my own use and do not anticipate much difficulty in obtaining further supplies if needed. My land is made up of a depth of 4′ of peat and the sub-soil peat below 18″ is ideal for casing. It has a natural pH of 6·5 to 6·6, and this is made up to 8·0 with hydrated lime.

In one shed the crop is grown on the floor on ridge beds and the others are on shelves. These are four shelves high of corrugated sheeting with 7″ back and front boards.

Water is from the mains and is very hard, coming as it does from chalk. Chlorine is used by the waterworks for purification. A half inch copper mains waterpipe is run through the hot flow pipe and out through the expansion tank to take the chill off for watering. So far as labour is concerned I employ only one regular man although I have been getting casual labour for straw cutting, etc. My wife and young son do most of the picking and the regular worker makes all the compost while I

see to the watering and all the other jobs. All the mushrooms that are sent away go to Leeds and there is a small local trade which has shown an increase since MGA publicity notices were put up.

Now to get down to detail on my method of growing. I prefer the straw to be dry and not older than two years. I believe the best straw to come off alkaline soil and dress my farm land with lime to get a soil of pH 7·0 and over. The straw is cut with a chaff cutter which, with the aid of four casual workers, turned out 12 tons of chopped straw per day. This is then carried in large bags into the compost house.

The major operation has always been turning and preparing this cut straw into synthetic compost and it was here that I felt a mechanical turner, wetter and mixer would be a valuable asset. Although smart and efficient looking factory models are now available, my first prototype was very much home-made, but for all this it answered my requirements. With the first turning of dry straw one man could put through up to $2\frac{1}{2}$ tons per hour.

The first turning is for a preliminary water saturation only and the saturated heap lays for ten days to remove the varnish and soften the straw. If the temperature of the heap exceeds 160° F. the centres are opened with a muck chrome to bring it down.

After the ten days it is ready for the second turn where more water is added together with a proprietary activator (ADCO M). The machine has been calibrated to spread the required amount of activator, which is 7 lb. per cwt. of straw. With wetted straw it is possible to put through 3 tons per hour. The volume of water is adjusted to give turned material of suitable consistency. By rapid machine turning only 10° to 15° of heat is lost and the turned heap heats up rapidly.

The turned heap, now with activator added, lays six to seven days and during this period the temperature is controlled to 155° F. In the third turn further water as required is added plus a suitable quantity of gypsum (7 to 14 lb. according to greasiness). After this third turn the heap is left for six days with a temperature of 155°. The fourth and last turn is for aeration only although water is added if needed. After five days the compost is then ready for use. 18″ ridge beds or 6″ shelf layers are put down and the compost temperature falls to 90°—100° F. As soon as this has fallen to 65°—70° spawning is carried out, moist spawn being preferred.

House temperature is held at 65°—70° until a good mycelium run can be seen (after 14—15 days) when the unsterilized peat subsoil is applied 1″ to $1\frac{1}{4}$″ thick for casing. The temperature is gradually dropped to 60° until pinheads appear when a very gradual drop to 55°—58° is made. With hand-made compost it was taking approximately eight weeks from spawning to picking, but with machine turned compost this period is now reduced to four weeks.

Beds are sprayed as necessary with the pre-warmed mains water

through hose pipe and controlled by a trigger lance. Careful application of spray is given to avoid panning.

Crop weight has gone up from 1½ to 3 lb. per sq. foot with using machine compost and it is now possible to put three crops through the heated houses per year instead of two, as was the case with the slower responding hand-turned compost. The crop is allowed a maximum of ten weeks cropping and is then taken out. All spent compost is returned to the arable land.

Before cleaning out, beds and house are sprayed thoroughly with 2% formalin using KEF crop sprayer equipped with a trailing pipe and a three nozzle lance. Immediately after spraying all doors and vents are closed and full heat is given for four days. After ventilation, cleaning takes place, all boards are washed and the whole house is sprayed with Jeyes fluid at two tablespoons per gallon through the crop sprayer lance. So far my cropping houses have been free from disease.

The machine I refer to for making compost is, of course, the Standen Hawkomatic which I designed myself and which was recently demonstrated for several days on my farm. I myself am perfectly satisfied with the performance of this composter. It does, I feel quite sure, give me a much more even compost all round with—and I consider this most important—a beautifully even spread of activator, not possible by the hand method. I am content for others to judge this machine by results and certainly I attribute a great deal of my own success to its use.

Mr. & Mrs. Arthur Hawkins and their young son gathering mushrooms from a ridge bed

NOT TO BE MISSED

Great interest is already being shown in the farm walk, arranged for Wednesday, 11th July, at the farm of Messrs. A. G. Linfield Ltd., of Thakeham, Sussex. This farm is the largest of its kind in Europe. In view of this widespread interest the MGA Executive Committee has decided that only MGA members, their wives or other nominee for the visit, shall be eligible to be present and entry to the farm will be by ticket only. Members will be advised when to make application for tickets.

MORE SUPPORT FOR PUBLICITY

Support continued to come steadily in for the MGA Publicity Fund during last month and the following contributions are hereby acknowledged:—

	£	s.	d.
Somers & Gibson Ltd., Salesmen, Smithfield Market, Manchester 4	26	5	0
Reuben Levy Ltd., Salesmen, Spitalfields Market, London, E.1	3	1	2
Walter Lund Ltd., Salesmen, Castlefolds Market, Sheffield	5	0	0
Langford Nursery, Clymping, Littlehampton, Sussex ..	2	12	6

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Dringport Works, The Airport, Portsmouth, Hants

NEVER SO LONG FOR SO LITTLE

By DAVID SMITH

The advertisement was bold and outstanding. It looked like a luxuriant tropical forest, gone slightly to seed. Great heavy headed mushrooms leant tipsily or ballooned out with great wide heads. There was no doubt in the advertisers' minds. You could grow mushrooms anywhere. The more unlikely the spot, the better.

Under the bed, in the cellar, up in a loft or even as a sort of profitable edging to an herbaceous border. There was no limit to it. Cautiously my wife and I agreed that perhaps we had been wasting our spare time. We had an old empty building, the remains of an old oast house long since pulled down. An unknown untapped gold mine.

" Just think of that money that building could be making," I said to my wife.

So we ordered the spawn and we got the leaflets and an extremely expensive thermometer, and started work.

I forget all the details now but I remember we built a large clamp of manure and we watered it and turned it and then the weather turned bitterly cold.

Incidentally I should say that this all happened about twelve years ago. Probably things are easier now, though my impression is that mushroom growing is a highly skilled and technical business. We grow green peas for the London market in the Summer and my old father always said: " That's as bad as backing horses. That's a gamble!"

And, without knowledge and persistent attention and hard work, I should say mushroom growing was a gamble too. Good luck to them 'as has the courage to have a go!

Anyway, to get back to our clamp. Maybe we started at the wrong time of year. But it was early October and my mind was full of pictures of autumn meadows sprouting thick with button mushrooms after the sheep had grazed.

But Winter came early. I like to think that was the trouble. We blocked every nook and cranny of the elderly building where our precious heap was housed. We lined the doors and the windows with sacking. We carted more water. We watched that thermometer like an anxious nursing mother with a sick child.

It did at least remain steady. I suppose that was something, but nowhere near what the book said was required before inserting the spawn.

" It must be stuck," my wife said, and I told her not to be silly. And then took it back to the shop and had it tested. Just to make sure. Of course, it was perfectly all right.

By now all this talk of thermometers and temperatures had made us feel rather as though we were watching a sick-bed. The clamp was our patient.

One day I came home and found that my wife had carried our oil stove out to the mushroom shed. We called it ' The mushroom shed ' now; the ' old malting ' was forgotten.

But the hard weather remained or our methods were faulty. The only thing that emerged from my thoughts of the Autumn was a faint musty smell.

Old Charlie Cartwright, our horseman, was the first to mention it. My wife and I had tried our best to ignore it.

" That owd shed o' yourn," he said to me, " that wholly fare do stink. Just as if you was walking through a wood in the Winter and knocked an owd toadstool over."

But eventually we did it. We got the temperature up and we put the spawn in as directed. Charlie was cynical.

" That 'oon't come to no good," he told us, " that's bin a'standin' about too long. You want a bit of fresh stuff for mushrooms."

Of course he was perfectly right, but our book hadn't stressed that point. We had tried heat without freshness.

Charlie went on: " Best thing you can do is to sell that stuff for leaf mould to a nurseryman. I dessay that 'ud grow a few nice chrysants."

And he passed on down the farm yard. Only to pause at the gate, sniff ostentatiously and call out: " I reckon that might make a bit of silage if you were to put some molasses along with it.

In the end we never grew one single mushroom. Not even one as a memento.

" We could have framed it or pressed it or even had it stuffed," my wife said sadly. " Just as long as there was something to remember our efforts by."

So every time I hear of people being successful with growing mushrooms I say ' Jolly good luck to them.'

To go round a modern mushroom farm is a real education. I took Charlie round one day at the invitation of a friend. He was amazed.

"Ain't that a marvel," he kept on saying. " Foreverlasting mushrooms and none of that stinking smell you had. Blast, that's as clean as my cowshed."

Then he turned to me and said: " Do you know I don't reckon you went the right way to work. You must have put the spawn in upside down!"

MEMBERSHIP DRIVE

All Grower Members of the MGA should have received a letter requesting the names and addresses of all mushroom growers known to them who are not MGA members. A special reply-paid card was enclosed with each letter. If you have not given this most important information to the MGA Secretary please do so without further delay. It is of vital importance.

CORRESPONDENCE :

PINHEAD COMMENTS

Pinhead No. 81

We have been accused of " lack of imagination " in the design of a ½ lb. Pre-pack carton for mushrooms, including the imitation of a colour scheme. As a matter of interest, the carton was designed by a well-known firm manufacturing various types of Pre-packs, and we did not even know that any one else used the same type. So far as colouring goes, the Covent Garden Salesman refused point blank to trade in any other colour than blue. Perhaps he is a Conservative!

Our so called " lack of imagination " has resulted in our being the first firm to produce Pre-packs in London where they are sold at approximately 1/- per lb. above the price of normal packs by Selfridges, Harrods and Whiteleys.

A little knowledge is a dangerous thing! A. L. A. DREDGE.

WINKING AT A PRETTY GIRL IN THE DARK

Mr. Eric Gardener, Chairman of the NFU Central Horticultural Committee, speaking to the National Federation of Fruit and Vegetable Trades at Torquay, on Monday, 7th May, said " To-day, when competition is so keen we must advertise. Running a business without advertising is like winking at a pretty girl in the dark. You may know what you are doing but nobody else does."

Mr. Gardener was speaking of the need for publicity for the horticultural industry as a whole and he came out slap bang in favour of a compulsory scheme to finance such publicity. He said that his experience with the Market Produce Show had made him appreciate two things. One was the very great value of publicity and the other was the difficulty of running a voluntary Society on a shoe-string income. He added " I am not afraid of seeking powers so that contributions to publicity can be universal. I believe that most of the opposition to any scheme requiring compulsion arises because it is not made abundantly clear what the objective is and how it is to be achieved. Our objective is to sell more horticultural produce—more fruit, flowers and vegetables. The method we intend to use is that of publicity. To do that we need money."

Later, Mr. Gardener referred to the considerable problems in devising a publicity scheme for the whole of horticulture. He said that the whole matter was being looked into.

Support for NFU Publicity Proposals

Mr. Nelson (National President) at the Retail Fruit Trade Federation's Conference at Rothesay, Isle of Bute, said that the Retail Federation was solidily behind the NFU's proposal to draft a marketing scheme for raising fruit and vegetable publicity funds on a compulsory basis. He said that the wholesalers' proposed scheme had fizzled out because it was voluntary and that the Federation had come to the statesmanlike conclusion that any funds for publicity must be raised on a compulsory basis from Retailers too.

MGA PUBLICITY SCHEME

Both the Executive Committee and the Publicity Sub-Committee acknowledge with pleasure the following contributions to the Publicity Fund. All concerned on the MGA side of this effort are gratified at the fact that, in the case of many contributors, it is an expression of renewed support and confidence in the efforts being made by the Association to further publicise the cultivated mushroom.

	£	s.	d.
Wm. Artindale & Son Ltd., Salesmen, Castlefolds Market, Sheffield ..	18	9	0
A. Phippen (Brentford) Ltd., Salesmen, Brentford	5	0	0
H. G. Walker Ltd., Salesmen, Covent Garden Market, W.C.2	10	10	0
Shirley Organics Ltd., Activators, Battersea, London, S.W.11	25	0	0
G. E. Leatherland Ltd., Salesmen, Newcastle-on-Tyne	57	6	0
T. J. Poupart Ltd., Salesmen, Covent Garden, W.C.2	100	0	0
Francis Nicholls Ltd., Salesmen, Smithfield Market, Birmingham ..	157	10	0
Marks & Co. Ltd., Salesmen, Covent Garden Market, W.C.2	2	2	0
Geo. Jackson & Co. Ltd., Salesmen, Smithfield Market, Birmingham ..	5	5	0
Thomas Elliott Ltd, Sundries, New Church Road, London, S.E.5 ..	10	10	0
C. H. Deakin Ltd., Salesmen, Smithfield Market, Manchester	10	10	0
H. Dowson & Co. Ltd., Salesmen, Newcastle-on-Tyne	1	1	0
J. W. Laws Ltd., Salesmen, Newcastle-on-Tyne	2	0	0
Dan Wuille & Co. Ltd., Salesmen, Covent Garden Market, W.C.2 ..	50	0	0
J. Collingridge & Co. Ltd., Salesmen, Covent Garden Market, W.C.2..	25	0	0
R. E. Jenkinson Ltd., Salesmen, Covent Garden Market, W.C.2 ..	105	0	0
Ed. H. Lewis & Sons Ltd., Salesmen, Covent Garden Market, W.C.2	5	5	0
P. C. Brown, Biddulph, Stoke-on-Trent	8	6	8
J. N. Proctor, Minskip, York	5	16	0
R. J. McBriar, Overdale, Saintfield, Belfast	5	5	0
N. Olverson, Scarisbrick, Nr. Ormskirk, Lancs.	5	0	0
Stable Manures Ltd., Newmarket and Worthing	30	15	9
J. Jones & Sons, Salesmen, North Market, Liverpool	3	3	0
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*W. Darlington & Sons Ltd., Spawn Merchants, Worthing
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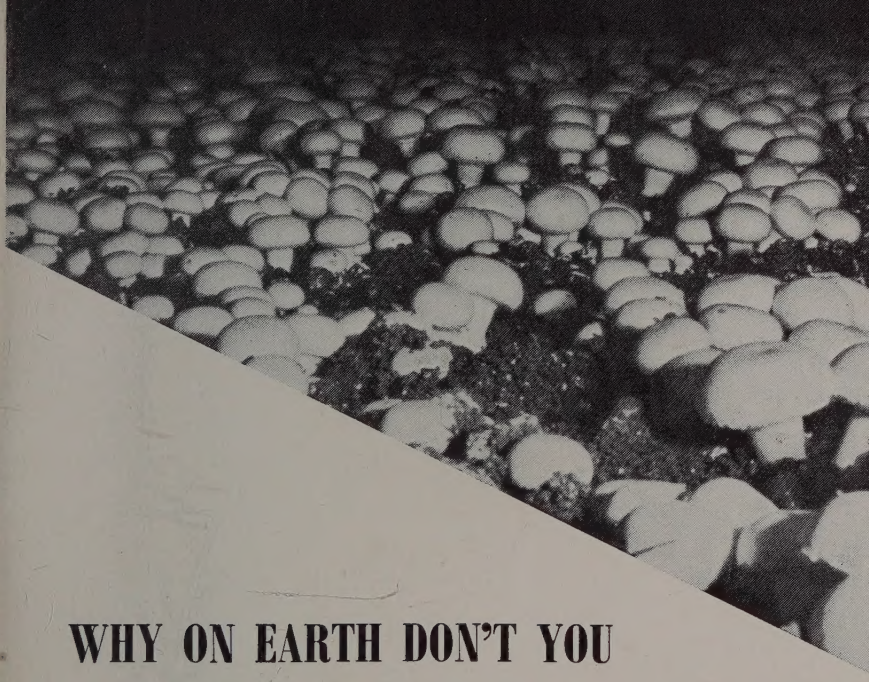

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